



DINOSAURS

UPPER EDMONTON FORMATION NEAR DRUMHELLER



PROVINCIAL MUSEUM & ARCHIVES OF ALBERTA, 12845 - 102 AVENUE, EDMONTON, ALBERTA, CANADA

CA2 ALWY 28
1971M11
c.2

ALBERTA LEGISLATURE LIBRARY



3 3398 00405 2287



Introduction

Alberta's most famous fossil deposits are the dinosaur-bearing rocks of the Upper Cretaceous. From two major areas, the Oldman Formation of Dinosaur Provincial Park, and the Edmonton Formation of the Drumheller region, have come specimens now displayed in the world's major museums. Indeed, Alberta specimens have provided much of our information about the Upper Cretaceous dinosaurs of North America.

A diorama at the Provincial Museum and Archives of Alberta shows the fauna, flora, and land features characteristic of late Upper Edmonton time, nearly at the close of the Age of Reptiles, about 64 million years ago. Although the animals are more crowded together than they would have been in life, the display shows the sorts of dinosaurs represented in Upper Edmonton rocks of the Red Deer River, as well as some members of other groups that did not become extinct with the dinosaurs.

Soon after the time represented in this diorama, all the dinosaurs except **Triceratops** disappeared, and at the close of the Cretaceous period, about 63 million years ago, **Triceratops** became extinct as well. At the same time, a great extinction was taking place in the sea, eliminating the three great groups of marine reptiles, the ichthyosaurs, mosasaurs, and plesiosaurs, as well as the ammonites and belemnites among the invertebrates.



EXTENT OF THE UPPER EDMONTON FORMATION



Tyrannosaurus (right) and Ornithomimus (left)

The Animals

Five types of dinosaurs are included in the diorama. **Tyrannosaurus** ("tyrant lizard"), the largest of all flesh-eating dinosaurs, was nearly 50 feet long and 18 feet tall when standing, and weighed about 8 tons. This giant reptile could have preyed on most of the other dinosaurs shown, and in the diorama stalks a fleeing group of **Ornithomimus**.

Ornithomimus ("bird mimic") is the smallest dinosaur found in Upper Edmonton rocks. Although toothless, **Ornithomimus** had a horny beak and could have eaten insects, lizards, or fruit, or dug up tender shoots with its forefeet. Some paleontologists think it might have eaten the eggs of other dinosaurs. **Ornithomimus** was probably a scavenger, eating a large variety of food and relying on agility to escape predators.

Triceratops ("three-horned face") had long horns with which to wound attackers, and a thick bony frill to protect its neck. It appears in Upper Edmonton and later rocks, and was the last dinosaur to become extinct. A plant-eating dinosaur, **Triceratops** was about 20 feet long and 9 feet high, and may have weighed 10 tons.

Anatosaurus ("duck-lizard"), the last of the duck-billed dinosaurs, grew to a length of about 24 feet. The feeding mechanism somewhat re-

sembled that of **Triceratops**, with a toothless beak in front and a battery of continually growing teeth behind. **Anatosaurus** normally stood on two legs on land, and was well-adapted to wade or swim in water. The diorama shows two feeding in the swamp, and one standing on land: two of the three are watching **Tyrannosaurus**, preparing to escape the giant carnivore if necessary.

Ankylosaurus ("stiffened-lizard") was a squat, armored herbivorous dinosaur which had bony plates around its head and on the upper part of its body. Long, strong bony spines stuck out from the sides, and the short tail ended in a large bony club. In order to use the tail club as a means of defense, **Ankylosaurus** would have had to move its whole body, as little motion was possible between tail vertebrae.

Two small opossums, representing the mammals, sit on the log behind **Ankylosaurus**. The mammals, though they originated in the Upper Triassic (about 190 million years ago), did not become dominant land animals until after the extinction of the dinosaurs.

In the diorama also are turtles, and in the background two **Champsosaurus** appear, one swimming and one on the shore. **Champsosaurus**, a crocodile-like reptile but not a true crocodile, survived a short time into the Age of Mammals.



Triceratops

The Plants

The vegetation of the Upper Cretaceous was diverse, with both the ancient tree ferns and cycads (ancient groups of plants very few of which survive today), and the more modern trees. Grasses were relatively common, but most Cretaceous grasses were types that grew in tufts, and grass did not become so common as to become the staple diet for grazing animals until nearly midway through the Age of Mammals. The swamp and pond edge

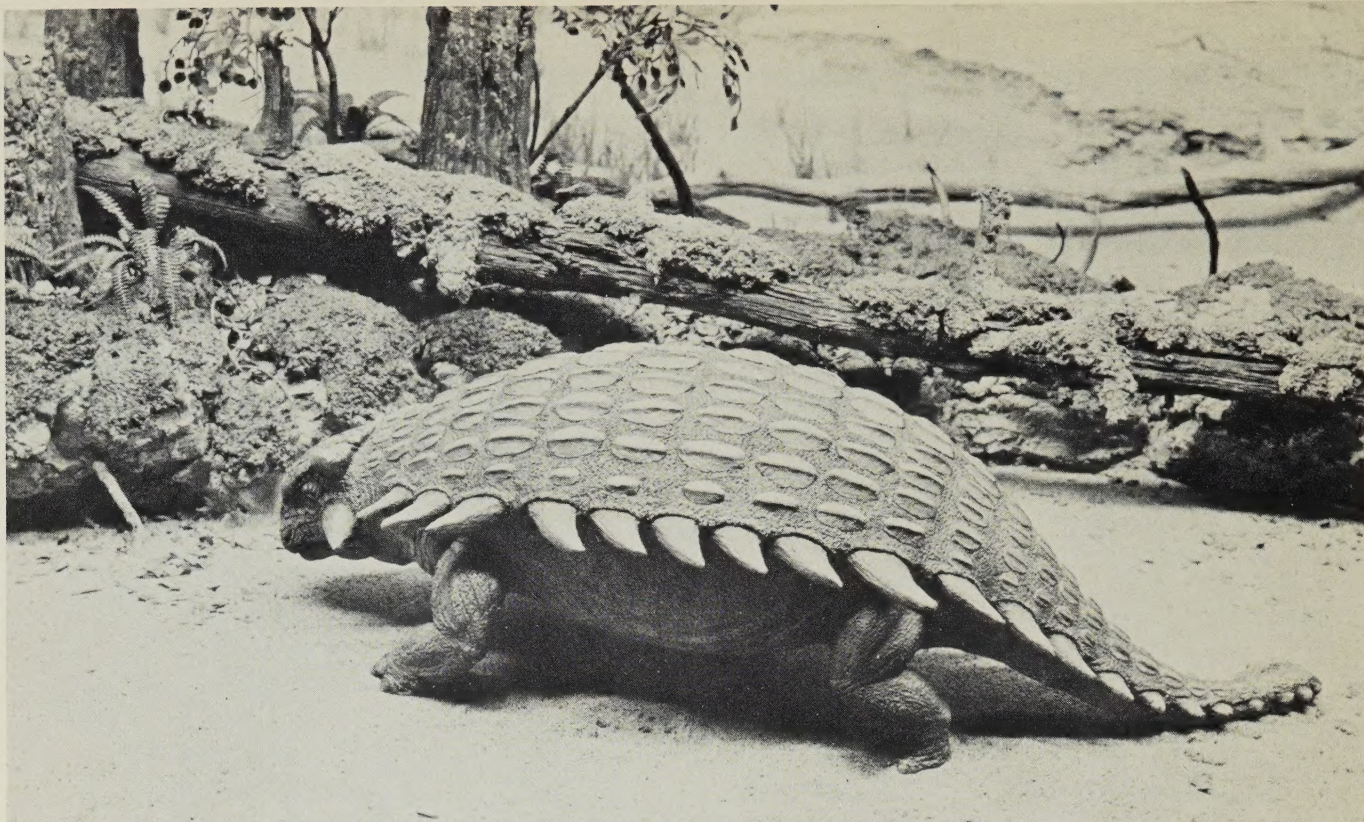
floras shown in the diorama include mosses, ferns, pond lilies, sedge, grass, alder, and sequoia. Also common in the Upper Cretaceous were cypress, ash, myrtle, beech, sweetleaf, sycamore, and mistletoe.

The Background

In the Upper Cretaceous, much of Alberta was low and marshy. A great inland sea, the Bearpaw Sea, extended northwest from the Gulf of Mexico, cover-



Anatosaurus



Ankylosaurus and opossums

ing southeastern Alberta, southern Saskatchewan, and southwestern Manitoba, as well as large areas of the United States. Deltas, composed of river-carried material from the slowly rising Rocky Mountains to the west, formed in lakes and at the edges of the Bearpaw Sea. These deltas make up the Edmonton Formation, and it is in them that dinosaurs are found.

The Edmonton Formation is made up of shale and soft sandstone, with coal seams. The Drumheller coal deposits, an Alberta resource of great economic importance for many years, are found in the Lower Edmonton Formation.

Volcanoes, such as the one seen in the background of the diorama, laid down great quantities of volcanic ash; this weathered into bentonite, a clay which becomes extremely slippery when it absorbs water. Bentonite occurs throughout the Edmonton Formation; in pure form it can be used as drilling mud.

Construction of the Diorama

Before this diorama could be prepared, a detailed survey of scientific reports on the flora and fauna of the Upper Cretaceous was made. The Provincial Museum and Archives of Alberta's Habitat Artist, Ralph D. Carson, then planned and built the diorama, always with painstaking attention to detail.

The dinosaur models were sculptured in papier maché on a scale of one to twelve. Most of the tree trunks were sculptured likewise; a few were modified from modern branches. The leaves were sculptured and cast in plastic, and then attached to the branches. The moss was made from paper pulp.

Foreground and background had to be carefully matched so they would blend as smoothly as possible, and careful attention to perspective was necessary, to give the proper impression of depth and continuity.

Written by:

D. A. Taylor, J. E. Storer

Photo Credit:

Provincial Museum and Archives of Alberta
Alberta Government Photo

Digitized by the Internet Archive
in 2022 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

